

No. 16143

IN THE

United States Court of Appeals

FOR THE NINTH CIRCUIT

AETNA STEEL PRODUCTS CORPORATION,

Appellant,

vs.

SOUTHWEST PRODUCTS Co., a corporation,

Appellee.

BRIEF FOR APPELLEE.

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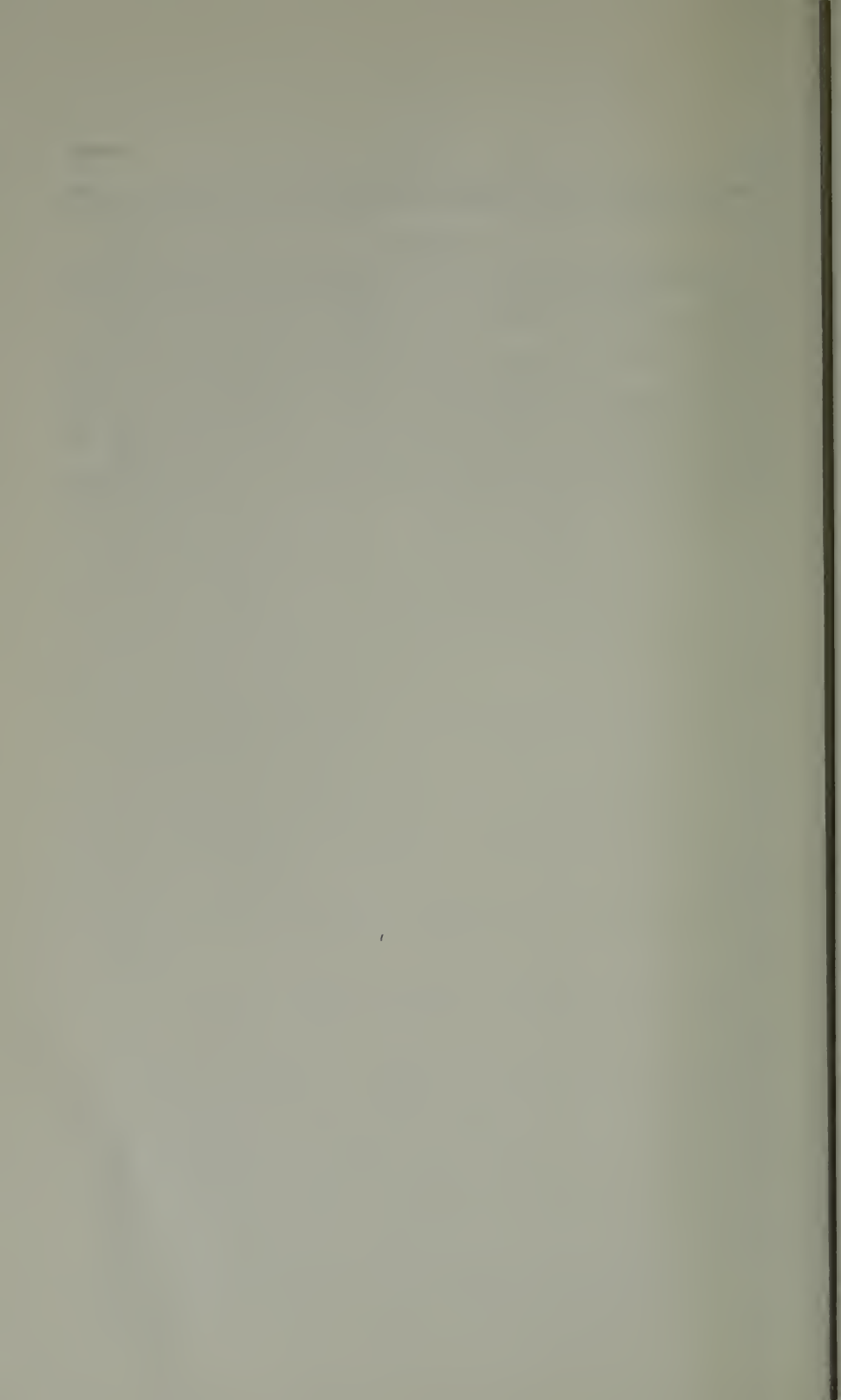
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BRIEF FOR APPELLEE.

I.

Statement of Jurisdiction.

Jurisdiction of the U. S. District Court, Southern District of California, Central Division, is based on the Patent Statutes of the United States [Complaint, R. 3], and this is admitted by defendant-appellant [Answer, R. 6, and Amended Answer, R. 79]. Appellant is referred to as defendant herein and appellee as plaintiff. The District Court's Judgment was entered on June 12, 1958 [R. 175] and defendant's Notice of Appeal was filed on June 13, 1958 [R. 176]. Jurisdiction of the District Court is therefore founded upon Title 28, Section 1338 of the United States Code, and jurisdiction of this Court of Appeals is founded upon Title 28, Section 1292(4) of the United States Code.

For brevity, plaintiff's Exhibits are sometimes referred to herein as "PX" and defendant's Exhibits as "DX".

II.

Statement of the Case.

A. The Issues—Generally.

The Complaint charges infringement of U. S. Letters Patent No. 2,626,841 [PX-1, R. 1296] issued on January 27, 1953 to Lee R. Potter on "Self-Aligning Bearing" (hereinafter sometimes referred to as the "'841" patent). The Complaint also charges infringement of U. S. Letters Patent No. 2,724,172 [PX-2, R. 1299] issued on November 22, 1955 to Lee R. Potter on "Method of Forming a Self-Aligning Bearing" (hereinafter sometimes referred to as the "'172" patent). Both of these patents were assigned to plaintiff, Southwest Products Co. [Finding I, R. 155; Pretrial Conference Order, R. 86].

The issues involve generally the validity and infringement of these two patents. The validity of these two patents was the subject of defendant's Motion for Summary Judgment [R. 42]. The Hon. William M. Byrne, United States District Court Judge, prior to actual trial of the case before the Hon. Pierson M. Hall, United States District Court Judge, denied that Motion [R. 68]. Judge Byrne also denied defendant's Renewed Motion for Summary Judgment [R. 78].

This action was tried before Judge Hall. The District Court's Opinion [R. 1283], Findings of Fact, Conclusions of Law and Judgment [R. 155] held claims 1 and 2 of the '841 patent in suit valid and infringed and also held claims 1, 2, 3, 4 and 6 of the '172 patent in suit valid and infringed, and awarded an injunction against further manufacture and sale thereof by defendants.

The only general issues before this Court on appeal are as follows:

(1) Did the District Court err in holding claims 1 and 2 of U. S. Letters Patent No. 2,626,841 in suit valid?

(2) Did the District Court err in holding claims 1 and 2 of U. S. Letters Patent No. 2,626,841 infringed by defendant?

(3) Did the District Court err in holding the claims of U. S. Letters Patent No. 2,724,172 in suit valid?

(4) Did the District Court err in holding claims 1, 2, 3, 4 and 6 of U. S. Letters Patent No. 2,724,172 in suit infringed by defendant?

B. The Potter Patents in Suit—Generally.

Potter Patent 2,724,172 [R. 1300] refers to Potter Patent 2,626,841 and was copending therewith in the United States Patent Office and was filed as a result of a requirement by the Patent Office that a division be made under 35 U. S. C. 121 [Finding LIII, R. 170]. All claims of the '172 patent are readable on the disclosure in the '841 patent [Finding LIV, R. 171]. The disclosure in the Potter '841 patent is sufficient to allow one skilled in the art to practice the method claimed in the '172 patent and to produce the article claimed in the '841 patent [Finding XLVIX, R. 169].

The '172 patent [R. 1300] relates to a process of forming the bearing of the '841 patent by press-forming, swedging or coining a cylindrical race around the ball and then liberating the race from the ball [Finding III, R. 156].

In forming the bearing of the '841 patent according to the process of the '841 or '172 patents, press-forming, swedging or coining of the race about the ball results in a condition in which the outer periphery of the race is stressed to place the same under tension and the inner periphery of the race is compressed. The stress pattern thus achieved is used to advantage in the liberating step in which the race is freed from the ball in controlled amounts by applying a rolling force on the outer periphery of the race [Finding VII, R. 156].

C. The Invention—Generally.

The Potter invention is a process of making self-aligning bearings and self-aligning bearings produced by the process. The bearing is best described by the method of making it. The bearing is a proprietary item sold by plaintiff and defendant to the aircraft industry. The bearing of the '841 patent was dependent upon the discovery of the method disclosed in the '841 patent and claimed in the '172 patent.

Self-aligning bearings are used in aircraft with or without lubrication and are not to be confused with anti-friction bearings in which there is rotation of a shaft constrained to rotate about a fixed axis as in, 'for example, a needle bearing. One important concept is that a ring is first formed so tightly around a ball that the ball cannot be moved by hand, *i.e.* the ring is initially bound to the ball. Another important contribution by Potter is that the clearance between the only two elements which comprise his self-aligning bearing may be *adjusted and controlled* [R. 908, 1009] so that indeed there may exist a preload condition as in plaintiff's pedestal-type self-align-

ing bearings [PX-14] used in supporting aircraft engines in the Douglas C-133 aircraft [R. 334]. In this particular instance [PX-14] the clearance is so adjusted that a large static frictional force purposely exists and hence there is no relative movement between the two parts unless a large torque having a value in excess of 100 inch-pounds is applied [R. 311]. In other instances, the stress in the cylindrical race seat is adjusted [PX-3B] to allow more free movement of the ball depending on its use within the aircraft.

An aircraft, in flight, is flexed and carries different controls and parts which must remain continuously operative when and as the aircraft is flexed and subjected to vibration [R. 948]. These controls are operated by a force transmission system involving a series of interconnected rods, links or levers, the particular arrangement of which is usually dictated by space availability and the forces required to be transmitted to operate and to maintain the controls in adjusted positions. These transmitted forces are both of the pushing and pulling types, *i.e.*, of the tension and compression types, and are applied from one rod or lever to another interconnected rod or lever at different angles which change either as the control is operated and as the aircraft flexes.

To effect and allow the transmission of these compression and tension forces which are applied by the adjacent rods or levers at changing angles, self-aligning bearings interconnect such rods or levers.

For these purposes the Potter self-aligning bearing includes only *two* parts, *i.e.*, (1) a ball having a bore there-through which serves as a means for attaching the ball to

one of such rods or levers [PX-3B] or to an aircraft engine for mounting the same [PX-14]; and (2) an outer cylindrical ball seat for attachment to the aircraft fuselage [PX-14] or to an adjacent rod or lever [PX-3B], such ball seat being in each instance [PX-3B or PX-14] uniquely fabricated with respect to the ball to provide not only *the* bearing seat for the ball, but to provide also a ball seat which is in such stressed condition that the clearance between it and the ball may be conveniently and accurately controlled or adjusted, starting from an initial condition of very small or "zero" clearance.

One of the most startling features of the Potter inventions is the difference in degree of the magnitude of the forces required in the two steps of forming and liberating. Thus, the Court witnessed the manufacture of plaintiff's Exhibit 63 at plaintiff's plant wherein the race was preformed about the ball in a press exceeding 250 tons in pressure and then liberated by tapping it about the periphery with thirty-six taps followed by a final thirteen or fourteen additional light taps to remove tight spots [R. 824, Finding XX, R. 163]. It is significant to note also that the intensity of these individual liberating forces are comparable to those vibrational forces to which the bearing is subjected in subsequent use in aircraft, yet such vibrational forces do not deteriorate the bearing. Thus, the manner in which such liberating forces are applied has some significance in establishing the unobviousness of the Potter invention.

Contrary to defendant's statements, plaintiff does not contend that invention resides in any particular value of clearance or end play; but plaintiff does rely on the new means and techniques forming the basis of the Potter

claims whereby a greatly improved, new and useful self-aligning bearing is produced in which the stress pattern developed in the single-piece ball seat, while being press-formed around the ball, may subsequently be used to advantage to achieve a controlled liberation [Finding VII, R. 156]. The liberation may be so controlled by these means and techniques to achieve a uniformly liberated ball [PX-3B] or a uniformly preloaded ball [PX-14; Finding XIII, R. 159].

The disclosure in the '841 patent, addressed to one skilled in the art, clearly describes *how* clearance is accomplished and the claims relate that structure responsible for such controlled or adjusted clearance.

D. History of Potter Invention and Plaintiff.

The history of the Potter invention and plaintiff go hand-in-hand. Both were conceived and developed with little capital. On the strength of the Potter invention, plaintiff today is a flourishing manufacturing business devoting substantially all of its efforts to manufacturing bearings in accordance with the teachings of the Potter patents [R. 829; Finding XLVII, R. 169].

During its infancy in 1944, many different persons having knowledge of the shortcomings in prior art bearings and realizing the value of the Potter invention, associated themselves with the Potter invention. These persons included Lee R. Potter, Kenneth V. Hackman, Ward D. Tracy, Alfred L. Spangenberg and Fred P. Silva [R. 253, 255, 257; Finding IX, R. 157]. These persons in 1945, adopted the names Halfco and Stearns, Halfco being the manufacturing entity and Stearns being the sales and engineering entity [R. 259]. Potter, Spangenberg and

Silva were partners in Halfco [R. 281] but this partnership was discontinued in 1945 because of the poor financial condition of Potter, the inventor [R. 292] and Potter, financially aided by Hackman, then started manufacturing bearings first under the name Stearns [R. 293] and later under the present name of plaintiff—Southwest Products Co. [R. 294]. The Potter spherical swedged bearings have met with wide acceptance and are produced not only by plaintiff and defendant but also by others [Fred A. Straub Affidavit, R. 939].

E. History of Defendant.

Spangenberg and Silva, former partners of Potter, continued to operate under the name Halfco and sold bearings to defendant Aetna. Such bearings were initially made by Straub for Halfco, as a sub-contractor, doing business under the name Frand Tool Co. [R. 473, 475]. Straub was required to be taught by Spangenberg to make such bearings [Finding X, R. 158, 500, 501]. Spangenberg, one of Potter's partners, was the die maker who made the original die for making the first of plaintiff's predecessor's bearings [Finding IX, R. 157]. On January 1, 1953, defendant, a New York corporation, purchased Straub's business; and Straub is now Manager and Vice President of the local Kahr Bearing Division of defendant.

Defendant recognized that there was invention in the process taught Straub by Spangenberg by defendant's taking a license from Halfco. Essentially all of the bearings made by defendant under the license were essentially of the same type and construction as those produced by plaintiff in accordance with the Potter invention [Finding XII, R. 158].

The process employed by defendant in its manufacture of two-piece spherical swedged bearings and rod ends does not differ in any essential respects from the process taught to Fred. A. Straub by Spangenberg [Finding XI, R. 158].

F. The Witnesses.

At the trial, plaintiff called Kenneth V. Hackman and W. D. Tracy, both of whom were associated with the Potter invention from its inception in 1944 and who testified respectively as the President and General Manager of plaintiff. Plaintiff also called G. A. Stock, its General Production Foreman, for an explanation of the techniques and apparatus used by plaintiff. Plaintiff called Fred A. Straub as an adverse witness.

Also, plaintiff called Thomas Barish, an expert with over 35 years' experience in the bearing art beginning as an engineer with SKF Industries in 1920 and being now a consultant in bearings for large airplane and automobile manufacturers. Mr. Barish is a member of the American Society of Mechanical Engineers, the Institute of Aeronautical Sciences, the Society of Automotive Engineers and the Society of Experimental Stress Analysis.

In 1952 Mr. Barish was clearly recognized by the United States Government as an expert on bearings when he was employed by the Air Force as a member of a team that investigated the ball bearing industry of all of Western Europe [R. 512]. Mr. Barish now does work on the average for about 25 different companies each year and his specialty is bearings [R. 512]. In addition, Mr. Barish has published approximately 27 technical articles over the past 27 years [R. 513] and has about 30 patents is-

sued in his own name [R. 536]. The Trial Court recognized Mr. Barish as an expert on bearings and allowed him to express his opinion with respect to Potter's contribution to the art [R. 521, 1011].

Defendant called only two witnesses: Fred A. Straub, Manager of its Kahr Bearing Division, and Lester V. Colwell, a college professor, as an expert whose experiences are largely those of a college instructor and professor [R. 593]. Mr. Colwell did not profess to be an expert in bearings or rotating machinery but his recited activities are mainly in the metal stamping or metal processing art without any particular reference to bearings [R. 592]. Apart from lacking qualifications as an expert in the bearing art, Mr. Colwell based his report [DX-L], on bearings furnished to him by defendant which were *not* representative of defendant's production; and, indeed, Mr. Colwell made no tests on defendant's commercial product [Finding XXXVI, R. 745, 747, 749, 755, 1033, 1036, 1041, 1044].

In addition to hearing witnesses in the courtroom, Judge Hall visited plaintiff's and defendant's plants during regular working hours where he also heard witnesses and observed and inspected their manufacturing processes and bearings and had an opportunity to be more fully appraised of the extent of plaintiff's and defendant's bearing manufacture [R. 793-861, PX-68-74].

G. Prior Existing Commercial Bearings.

Prior to the Potter invention, the practical art, as represented by the Prentiss bearing [PX-11], the Heim bearing [PX-12] and the Messerschmidt bearing [PX-13], was in many cases unsatisfactory and a long felt want existed

for a simple, heavy duty, two-piece continuous spherical bearing [Finding IV, R. 156].

Of these three bearings, the Messerschmidt bearing [PX-13] is the only one which may be considered as a two-piece bearing but it involves a different manufacturing process, and a different coaction between the ball and the outer race member, largely as a result of the different manufacturing process; and further it has some disadvantages which are obviated by the Potter invention.

The Messerschmidt bearing, sometimes referred to as a slide or slot-type bearing [R. 317], involves a manufacturing process in which the outer race member is machined and has a portion cut out to provide a keyhole-type slot to allow the ball to be slid into the outer race member [R. 316]; and no forming operations are involved. When the ball is turned a certain way, it will drop out of its seat.

Thus, the Messerschmidt-type bearing, due to the keyhole slot for the ball, is limited in its application. The designer or user is limited to placing the bearing in such position that the load on the bearing is not in the direction of the keyhole slot [R. 964].

The Prentiss rod-end bearing [PX-11] involves the use of an outer member, a ball, a rubber insert, a washer and a portion of the outer member peened or staked to retain the assembly comprising the washer, rubber insert and ball. These washers in the field or in service in aircraft fall out and cause the bearing to fail [R. 251, 252, 385]. It appears very doubtful that the Prentiss-type bearing is being manufactured today [R. 373, 386].

The Heim bearing [PX-12] and Heim Patent 2,476,728, DX-D, or [R. 1419], has a machined outer holder with a rib on the inside to act as stops for bronze inserts which are inserted between the ball and holder [R. 318]. Under vibration these inserts 14, 15 shown in the Heim Patent 2,476,728, tend to loosen and in some cases have actually fallen out together with the ball [R. 319].

Self-aligning bearings used in the automobile industry are illustrated in the Skillman Patent 1,793,874 [R. 1371] and these involve four-piece bearings involving bending sheet metal around "fibrous or compressible materials" [R. 637].

The bearings as manufactured by the plaintiff and its predecessors were instantaneously successful, accepted by the trade and satisfied the long felt want mentioned above [Finding V, R. 156].

H. Patented Art.

Defendant relies on disclosures in at least 14 patents which are listed below in alphabetical order.

H 1. The Birchwood Patent 1,050,422.

Birchwood 1,050,422 [R. 1345] cited by the Patent Office discloses a coupling and (1) the method of producing the same is distinctly different, and

(2) the coupling he uses in such different manufacture is distinctly different, and

(3) the ball 20 is not engaged by a continuous cylindrical portion of the outer coupling member since the method disclosed depends on forming the slotted portion 14; *i.e.*, the ball is not engaged by a ring, and

(4) Birchwood bends *two cantilever*-supported elements indicated at 15 together, whereas in the instant invention a continuous ring is compressed in even contact with a ball, and

(5) since Birchwood's outer member is not in the form of a continuous ring, the same cannot be subjected to rolling pressures or the like for achieving stresses and/or achieving a controlled amount of clearance between the movable elements, and

(6) any stresses produced by Birchwood in bending the *two cantilever*-supported elements indicated at 15 are considered undesirable by Birchwood and he thus prefers to relieve such stresses by tempering so as to strengthen his inherently weak structure. On the other hand, the instant invention does not consider the stresses produced in manufacture to be a disadvantage but, indeed, the resulting stress pattern is used to advantage in performing the subsequent step in the process, *i.e.*, to aid in freeing the ball from the heavy metal continuous ring which is pressed in binding engagement with the ball, and

(7) Birchwood does not show, suggest or teach that the outer member should be pressed in binding engagement with the ball to achieve important purposes of the instant invention, namely, to achieve a controlled amount of clearance between the inner and outer member, starting from zero clearance.

(8) Birchwood provides no suggestion or teaching whereby his ball could be freed even though it accidentally were locked in the outer member. If such an accident did occur, one skilled in the art would not apply a rolling pressure or the like to the cantilever-supported elements indicated at 15 but would use a tool somewhat like a

screwdriver to pry such elements apart. In any event, a uniform and/or controlled clearance between the ball and the outer member would not result. Furthermore, in a strict sense, Birchwood does not provide a two-piece coupling since the ball 20 is considered as one element and the purposely formed cantilever elements 15, 15 are considered as second and third elements which are purposely formed to move relative to each other.

H 2. The Chambers Patent 2,382,773.

The Chambers patent 2,382,773 [R. 1406] was cited by the Patent Office during the prosecution of both the '841 and '172 patents; and the Chambers method and bearing have not been in commercial use [Finding XXII, R. 164].

There is grave doubt that bearings may be made following Chambers' teachings [R. 337, 455]; and defendant's Exhibits N-1, N-2, N-3, AC-1 and AC-2 are not built in accordance with the Chambers patent [Finding XXXI, R. 1131.]

Chambers shows a four-piece bearing which includes, in Figures 2 and 3, the ball 10A, the "part" 11A and a pair of wedge-shaped washers 23 in circular V-shaped grooves in each side of the main body part 11A. These circular V-shaped grooves are cut in the race member (thereby weakening the same) to leave some lips or up-standing pieces of metal 20A and these lips 20A are subsequently bent inwardly, after which the wedge-shaped washers 23 are inserted in the precut grooves. Chambers' forming operation is confined only to deforming lips [R. 619, 1022] and Chambers requires such grooves [R. 624, 625]. The Chambers patent does not mention, suggest or

teach a binding action and does not contemplate a subsequent loosening operation.

In manufacture, the dies 20 and 21 are used to pinch a portion of part 11A, *i.e.*, a pair of lips, around the protruding ends of the ball, solely for the purpose of retaining the ball and not for producing binding engagement therewith. Since formation of the lips results in weakening of the part 11A, a pair of wedge-shaped washers are required to be inserted in the grooves on opposite sides of the part 11A. Any stress pattern developed in deforming such lips is not used to advantage in subsequent loosening for the simple reason that no loosening is contemplated. There is absolutely no suggestion or teaching in Chambers that the ball be actually bound against rotation at any time of manufacture. Still further, there is no teaching in Chambers that rolling pressure or the equivalent be applied to the part 11A to free the ball (which, of course, in Chambers is not locked).

The other arrangement shown in Figure 1 of Chambers is also a four-piece bearing which includes a ball 14, a part 11 and a pair of pellets 20, 20 which are "melted and fill the space on opposite sides of the web 18." The modified pellets 20, 20 do not bind the ball but the reverse is true, *i.e.*, they "permit a free uniform movement of part 10 without any binding." Likewise, there is no teaching or suggestion in Chambers that a rolling force or the like should be applied to any part to achieve a desired clearance.

H 3. The Erickson Patent 1,481,000.

The Erickson Patent 1,481,000 pertains to a retainer for balls in a ball bearing construction. There is no effort to produce a binding engagement or a very intimate con-

tact between the ball and ball retainer. Further, there is no showing, suggestion or teaching of a liberating step [R. 1012].

H 4. The Fiegel Patent 1,693,748.

The Fiegel Patent 1,693,748 [R. 1368] was cited and considered by the Patent Office during the prosecution of the '172 patent. The Fiegel bearing is made by placing babbitt 14 within a steel shell 11, shaping the babbitt to form a hemispherical recess, introducing a ball into the recess and then closing in the end of the recess to confine the ball. Babbitt has very little spring-back and it is unlikely that it could be made to bind the ball [R. 1013]. The Fiegel bearing is thus not a two-piece bearing and a spherical socket is machined in it [R. 709]. The babbitt metal is not coined about the ball; and very intensive force applied to the babbitt would squeeze it out [R. 711].

Figure 6 of the Fiegel patent teaches a die which is not confining and one which exerts force in only one local direction [R. 1111] for purposes of bending in a retaining lip.

Fiegel is limited to a material which is highly yielding such as babbitt or a very soft copper and will not work with materials such as bronze [R. 1113, 1114]. In any event, it is clear that Fiegel does not contemplate or provide a method whereby a ball is bound against rotation. Also, there is no teaching that a rolling pressure be applied for production of a uniform clearance. Indeed, the Fiegel disclosure is less pertinent than Chambers 2,382,773 [R. 1046] which was also cited by the Patent Office and which has two bent lips instead of one bent lip as in Fiegel. The Chambers patent was the subject of abundantly

much more testimony than the Fiegel patent and the Trial Court has given ample consideration to both Chambers and Fiegel. Neither Fiegel nor Chambers teaches Potter's new method or the two-piece bearing resulting therefrom.

H 5. The Heim Patent 2,476,728.

The Heim Patent 2,476,728 [R. 1419] was cited by the Patent Office during the prosecution of both the '841 and '172 patents. The Heim Patent 2,476,728 relates to the manufacture of a four-piece bearing of the Heim type [PX-12]. This is in contrast to the Potter bearing wherein a two-piece bearing is provided. Many bearings were made commercially in accordance with the Heim patent and it was generally accepted, prior to the Potter invention, that it was impossible or not feasible to make a two-piece bearing consisting simply of a ball and an outer race member unless the outer race member were provided with a keyhole-type slot through which the ball may be inserted as illustrated by the Messerschmidt bearing [PX-13]. Thus, an alternative construction involves the use of inserts such as the inserts 14 and 15 of Heim.

Heim designates the preformed inserts 14 and 15 as "bearing rings" and they are rightfully designated so since they bear against the ball. These bearing rings 14 and 15 are not press-formed around the ball but are preformed and then inserted between the ball 16 and the outer holder 12.

In Heim's manufacture, there is *no* press-forming of either the bearing rings 14 and 15 or the holder 12 around a ball.

Apart from facilitating the manufacture of bearings, the Potter invention serves to provide an improved bearing in which there is a maximum contact area between the ball and the bearing ring. In this respect, the bearing rings 14 and 15 in Heim are separated from each other by an air gap, thereby rendering the amount of otherwise available contact area unavailable. This is of importance in providing a small-size bearing capable of accommodating large tension and compression forces.

The holder 12 of Heim cannot be considered to be "an outer race member" since it does not contact the ball 16.

It is observed also that the amount of pressure applied to the holder 12 of the bearing rings 14 and 15 inserted between the holder 12 and ball 16 is very critical; otherwise there is a great likelihood that the bearing rings 14 and 15 may be loosened too much and, indeed, fall out during manufacture or subsequently after use.

Heim does not free a ball from an outer bearing race by applying his force to such bearing race since the force in Heim is not applied to the bearing rings 14 and 15 but to the holder 12 to produce relative movement between, on the one hand, the holder 12 and the bearing rings 14 and 15, *i.e.*, to loosen such bearing rings 14 and 15 [R. 779]. Further, the application of force to the holder 12 in Heim does not change a stress pattern in the bearing rings 14 and 15. Indeed, Heim uses his force in an entirely different manner and the effect produced is quite radically different from what Potter envisages as a liberating step. Further, in Heim the ball 16 is not locked by press-forming either the holder 12 or the bearing rings 14 and 15.

Thus, the Heim bearing is manufactured in distinctly different manner and the completed bearing is distinctly different structurally.

H 6. The Hoern Patent 1,798,738.

In the Hoern Patent 1,798,738 [R. 1376] a hard solid ball purports to be forced into solid metal, *i.e.*, a hexagon-headed stud, to produce an indentation or cavity slightly greater than half the diameter of the ball with an upper marginal lip retaining the ball. The ball is in the end of the hexagon-headed stud with only a portion of the ball protruding. This is an entirely different structure than that contemplated and claimed as being the Potter invention. The ball in Hoern cannot be attached to a member for the transmission of tension forces and thus a different structure is involved.

In Hoern the outer member is not pressed around the ball as in the instant invention and furthermore Hoern, instead of requiring only one die-forming operation, requires two die-forming operations. In the first die-forming operation shown in Figure 2 of Hoern, the ball is not used at all but the end of the stud I is "upset" and the upsetting process results in a haphazard distribution of stresses which certainly does not follow applicant's stress pattern and such stresses are not such as to be of advantage in further manufacture of the structure.

In the second die-forming operation shown in Figure 4, the ball is squeezed into the end of the stud to form only one ball-retaining lip 10.

Hoern is not concerned with the size of the clearance or its uniformity since he prefers to loosen his ball by

heating and quenching [R. 1016] and also suggests a crude manner of applying hammer blows to three flats on the hexagon-headed stud. This procedure, considering the condition of the preformed metal indicated in Hoern Figure 2 and the fact that the stud is not cylindrical but is in the form of a butt-ended hexagonal stud, does not allow a uniform and controllable clearance [R. 1015, 1096]. For the type of loosening envisaged by Hoern, considering the fact that he prefers to use quenched heat, hitting the stud at three sides would be enough for Hoern's purposes [R. 1096]. Hoern certainly does not contemplate the application of a rolling pressure or its equivalent as explained under heading I, *supra*, since Hoern's stud is not round but hexagonal. In other words, in Hoern there is no liberating force applied to a median portion of a cylindrical ring which has a preformed favorable stress pattern for facilitating the freeing of the ball and for assurance of a uniform clearance at all regions between the ball and the outer race member. Further, the Hoern bearing could take very little or almost no radial load because the flat on the ball at the top could not transmit it. Therefore, in Hoern no effort is made to cause the bearing to take any such load or to maintain small clearance in the radial direction [R. 1100].

H 7. The Offutt Patent 1,100,695.

The Offutt Patent 1,100,695 [R. 1350] pertains to "apparatus for making seamless tubes" and provides means for loosening tubing from an arbor. The Offutt patent thus does not relate to the production of bearings and, indeed, the means contemplated by Offutt affords only a very coarse loosening [R. 1009].

H 8. The Paulus et al. Patent 2,480,043 Is Not Prior Art.

The Paulus et al. Patent 2,480,043 [R. 1423] was filed on May 5, 1945 and there is sufficient evidence in the record to establish Potter's invention dates prior to Paulus' filing date. Please note that Potter had completed his invention and that an order was received from Ryan for 2012 bearings [R. 269, PX-19] in February 1945. Thus, in accordance with *Milburn v. Davis-Bournonville*, 270 U. S. 390, the Paulus disclosure may not be used as a reference. Even if the Paulus disclosure could be used as a reference, which plaintiff denies, the same is insufficient for defendant's purposes for the following reasons.

Paulus et al, 2,480,043, relates to a method of journaling a shaft in a bushing and involves the manufacture of an entirely different article. The difference lies mainly in the fact that a cylindrical "shaft" and a "ball" are two distinctly different elements and are used for different purposes and further, their assembly involves different manufacturing techniques.

Paulus is not interested in *press-forming* an element around another element to lock the same and then applying a mechanical force to provide looseness. Further, Paulus is not concerned with the production of bearings in which one of the bearing elements is a ball. Also, Paulus is not concerned with the development of a stress pattern, as in the instant invention, that is used to advantage in achieving a controlled amount of uniform clearance. The bushing 2 is a thin-walled element of uniform thickness and is included between the shaft 1 and an outer body member 10. This is because the thin-walled bearing 2, as such, is not suitable for an outer bearing

member, the body member 10 being provided for such purpose. Further, the bushing 2 does not *retain* the shaft. There is no suggestion or teaching that the outer bearing member 10 be press-formed around a ball or a shaft or that there be a force applied to such outer member 10 for loosening purposes. Thus, strictly speaking, the bearing of Paulus is at least a *three-piece* bearing with elements at 2 and 10 and with the bushing 2 being in the form of an insert. Distinctly different problems are involved in making a *three-piece* bearing with a *rotatable shaft* than there are involved in making a device as in the instant invention, namely a *two-piece* bearing in which one of the two elements is a *ball*.

H 9. The Porter Patent 1,123,796.

Porter No. 1,123,796 [R. 1357] discloses a three-piece joint that includes the packing 14A cooperating with a flattened ball to prevent binding. The packing 14A is lodged so that it may be stressed on movement of the ball and is stated by Porter "to be especially desirable to provide the packing with some form of lubricant." On the other hand, the Potter invention eliminates the necessity for any packing. The ball is retained in Porter against a resilient packing about the "upper inturned edges" of the socket. The joint thus provided depends solely for retention of the ball on the "upper inturned edges" and is inherently weak [R. 1009, 1110]. The packing material 14A, because of its resilient nature, prevents binding of the ball in the socket when the upper end of the socket is inturned. This is distinctly contrary to the teachings of the Potter invention wherein binding is accomplished between the inner and outer race members and on the maximum

large extended continuous area, *i.e.*, not only along an edge. Porter is not concerned with the problem of freeing a ball once it has been locked during its manufacturing process since the ball is prevented from binding due to the resilient packing 14A. Furthermore, Porter's socket is not adapted for the application of rolling or other pressures to relieve stresses.

H 10. The Skillman Patent 1,793,874.

The Skillman Patent 1,793,874 [R. 1371] relates to a four-piece bearing constructed of thin sheet metal [R. 712, 1014]. Skillman uses "fibrous or compressible" materials and is intended primarily for use in automobiles [R. 637]. The Skillman patent does not show, suggest or teach coining; and the metal-bending operation of Skillman is distinctly different from coining [R. 637]. The Skillman patent does not show, suggest or teach a metal-forming operation in which a ball is bound; and consequently, the same does not show, suggest or teach any liberating process.

H 11. The Spangenberg Patent 2,462,138 Is Not Prior Art.

The patentee in Spangenberg 2,462,138 [R. 1412] is no stranger but is the same Alfred L. Spangenberg who was one of Potter's partners in the earliest days of Halfco and was in a position to see Potter's designs [R. 280, 281; PX-17A, PX-21]. The Spangenberg patent may not be considered as prior art for the additional reason that its filing date is November 28, 1945 which is subsequent to the filing date of the '841 patent and effective filing date of the '172 patent, *i.e.*, subsequent to July 23, 1945.

Milburn v. Davis-Bournonville, 270 U. S. 390.

Defendant's loosening is accomplished not only by the use of a removable grease film but by the same techniques which Spangenberg taught Straub prior to issuance of the Potter patents [R. 500, 503]; and these comprise rolling [R. 940] as well as the application of hammer blows evenly around the center line of the outer one of a two-piece bearing [R. 941].

Although defendant applied the Spangenberg patent number to some of the bearings which defendant made in connection with a license agreement with Halfco, very few, if any bearings at all, were manufactured under the Spangenberg claims [R. 299, 307], these claims being directed to the concept of a removable grease film between the ball and race member.

H 12. The Taylor Patent 2,382,439.

The Taylor patent 2,382,439 [R. 1402] relates to a method for making outer ring members for Messerschmidt bearings [R. 635]. Please note carefully that the outer ring 5 is formed around an auxiliary "former member 9" and *not* around the ball of the finished bearing. After the forming operation, the former member 9 is removed from the ring 5 as illustrated in Figure 6 of the patent. This means that after the forming operation shown in Figure 4, the former member 9 must first be rotated to a position shown in Figure 5. Consequently, it cannot be stated that the former member 9 is completely bound in the ring 5 after the forming operation; otherwise the member 9 could not be rotated to the position shown in Figure 5. This is acknowledged by Colwell [R. 636] in which he characterizes the former member 9 as being "badly frozen" in the ring 5. Further, after the

member 9 is rotated to the position shown in Figure 5, it is pushed out of the ring 7 to produce "a miserable looking mess" [R. 636]. The forming operation accomplished by Taylor is quite different from the operation performed in Chambers [R. 637].

There is no mention of loosening or liberating in Taylor and while the Taylor patent indicates that the member 9 is very strongly held yet this cannot be so since otherwise the former member 9 could not be rotated through 90 degrees as indicated in Figure 5 [R. 731]. Indeed, the former member 9 has no hole therethrough and thus if it were not relatively loose in the ring, considerable difficulty would be encountered in rotating the same [R. 732].

Taylor uses the former ring 9, Figure 4, repetitively in making each successive race [R. 896]. In Potter each bearing uses its own ball as a member of the composite die in contrast to Taylor which requires an auxiliary die. This involves more than a mere matter of choice or degree in that Potter teaches and uses the concept of coining a ring to fit the bearing ball itself exactly and intimately over the entire surface of the race ring [R. 898].

Taylor does not obtain a bearing with an intimate and direct contact; he only obtains an intimate and direct contact on the die piece not later used in the bearing [R. 1019]. Since the former ring 9 is not tightly bound in the ring 5, Taylor does not require loosening since he just forces the die piece out of the ring to replace it later by a new ball which becomes part of the bearing; and that means that the fit which exists in the final bearing is subject to (1) machining tolerances of the ball; and (2) variations in the ring 5 formed on a die piece 9 which

is not the piece used in the bearing [R. 1019]. While the initial stress pattern set up in forming the ring 5 about the auxiliary forming ring 9 closely resembles that existing in the Potter race ring, the stress pattern in Taylor is detrimentally altered in the process of pushing the former ring out of the race [R. 1020]. After the forming operation in Taylor a two-piece assembly exists, not a two-piece bearing [R. 1132].

H 13. The Townsend Patent 2,335,710.

The Townsend Patent 2,335,710 [R. 1400] relates to bullet core stripper machine for "removal of jackets from the steel cores of armor piercing bullets for the purpose of salvaging steel cores." Obviously this patent does not relate to the manufacture of bearings. There is obviously not involved here the question of press-forming an element around another element to establish a stress pattern which is used to advantage in achieving a controlled amount of uniform looseness between any two elements . . . not to mention bearing elements. '

H 14. The Weibull Patent 1,465,700.

Weibull, 1,465,700 [R. 1360] discloses a roller cage for thrust bearings which is an entirely different article than that with which the present invention is concerned. The balls are retained by "edges 5" which are bent around the balls. The manner in which such "edges" are bent is left to conjecture. Furthermore, the balls are never locked by such "edges" and even if they were accidentally locked, the structure is such that the ball could not be freed by applying a rolling pressure or the like thereto. This patent thus fails utterly to provide a teaching that an outer race member should be formed around a ball into binding

engagement and then freed by the application of rolling pressure or the like [R. 1011]; and indeed, the structure is not such that the rolling pressure or the like may be applied thereto.

I. Limited Equivalence of Pressure Rolling and Hammering.

Pressure rolling and hammering with respect to the Potter invention and plaintiff's and defendant's production are equivalent only when the cylindrical race member is tapped evenly along evenly spaced points on its circumference in a manner analogous to the application of a rolling pressure.

The '841 and '172 patents clearly teach the application of a uniform force applied uniformly along the circumference of the outer cylindrical race member. This teaching is incorporated in plaintiff's commercial production [R. 347, 361, 364]. Thus, Stock testified at pages 363-365:

"The Court: It could be done by hammering?

The Witness: Yes.

The Court: By tapping it?

The Witness: Yes. The resultant wouldn't be as good as this method, but it could be done.

Mr. Lyon: It is done, as a matter of fact, on some of the production at Southwest Products, is that right?

The Witness: That's right.

The Witness: What difference is there?

The Witness: Hitting it with a hammer gives you individual peen marks, individual areas of contact where you have actually hit it. In contrast to a rolling motion that is smooth and even the same degree all over (222).

The Court: When you put it through this rolling motion, the metal, all of the metal is stretched all over equally?

The Witness: Yes.

The Court: If you hit it with a hammer is all the metal stretched equally?

The Witness: No. Only in one spot.

The Court: Only the spot where the force of the hammer is applied?

The Witness: Yes.

The Court: Suppose you put that in a vice, a hammer-like vice, where you hit it all at once?

The Witness: It could be done.

The Court: But tapping it outside of the ball race would stretch the material only in the spots where the hammer hits?

The Witness: Yes.

The Court: Would that make an uneven ball race on the inside?

The Witness: Yes, sir.

The Court: It would?

The Witness: Yes.

The Court: All right.

Q. (By Mr. Miketta): In all instances, or only if you hit it too hard (223)? A. Only if you hit it too hard. You must control—the human element of a man with a hammer is very difficult to control. A machine is easy to control.

Q. If you had an air hammer where the air pressure could be regulated, and the length of stroke could be regulated, then you could have a sequence of closely adjacent blows along the periphery, or depending upon the contour of the hammer head, to give you the proper result, couldn't you? A. It could.

The Court: If they were close enough together?

The Witness: That's right. If they could be made to the infinite plane of a steady motion. Which could never be achieved, actually. But it could come close."

Stock, later at plaintiff's plant, demonstrated the manner in which the ball is uniformly freed by tapping [R. 824] using a total of 49 controlled hammer blows.

When hammering is accomplished crudely, the ball seat includes "rough places and places that are tight. In other words, it does not work smoothly all the way around" [R. 783].

Thus, the Potter method of liberation involves the application of a relatively light pressure to relieve the compression on the inner surface so as to obtain a very small and carefully controlled clearance. [R. 1008].

J. Claims in Potter Article Patent 2,626,841.

The Potter Patent 2,626,841 relates to a self-aligning bearing consisting solely of an inner bearing ball and a single piece *continuous* outer race member. Each of the claims of the '841 and '172 patents involves the concept of first forming a ring so tightly around a ball that the ball cannot be moved by hand [R. 1288]. The '841 patent matured from the Potter application Serial No. 606,678 [DX-A] filed on July 23, 1945 with both article claims 1, 2 and method claims 3 and 4. The first Patent Office Action dated December 4, 1946 required Potter to divide the article claims from the method claims and accordingly method claims 3 and 4 were cancelled (without prejudice) on May 15, 1947, and also article claim 5 was added. In the next Office Action, on June 22, 1948, the first one of the merits of the article claims, article claims

1, 2 and 5 were rejected on Chambers 2,382,733 [R. 1406]; and in response thereto Potter, on December 8, 1948, substituted article claim 6 for article claims 1, 2 and 5. Claim 6 was then rejected on formal grounds and also on Chambers 2,382,773, in view of Heim 2,476,728 [R. 1419], and in response to this rejection Potter rewrote claim 6 as claim 7 on March 6, 1950, and presented to the Examiner good reasons why claim 7 is patentable over "Chambers in view of Heim." These same good reasons are not contrary to any of the testimony adduced at the trial but, indeed, were bolstered and made the basis of specific findings by the Trial Court [Findings XX, LVIII, R. 161].

Claim 2 of the '841 patent (claim 8 of the application) was submitted on July 6, 1951 and it was allowed together with amended claim 7 (claim 1 of the '841 patent) on April 1, 1952; and the patent issued on January 27, 1953.

Beginning with the filing of the '841 application and continuing throughout its prosecution, claims were directed to the combination in which a ball is within a single-piece race member.

Thus, the article claims originally filed include claims 1 and 2 of the application which are as follows:

"1. A self aligning bearing, comprising, a bearing ball having a spherical bearing surface and an axially disposed work piece receiving bore, and a bearing race having a raceway therein corresponding with the spherical surface of said bearing ball to freely journal the bearing ball in said raceway, said bearing race being of single piece construction.

"2. A self aligning bearing, comprising, a steel bearing ball having a curved bearing surface, and a

single piece bearing race of maluable (sic) material having an inner raceway corresponding in curvature with the curved surface of said ball and in which said ball is rotatively retained."

Comparing claims 1 and 2 of the application with claims 1 and 2 of the '841 patent [R. 1296, PX-1, Appendix], it is seen that they are all directed to the same combination, namely a bearing comprising a ball within a single-piece outer race member, the only essential difference being that patent claims 1 and 2 more clearly delineate the combination of the same two elements.

The specification in the '841 patent is as it was in the originally filed application; and likewise, the drawings filed in the originally filed application are identical with those in the '841 patent without any change in structure or relationship of the parts except for minor addition of hatching in response to the Examiner's requirement that "the parts in section must be hatched" [DX-A, p. 9].

It is thus clear that the patent claims 1 and 2 are more delineated than are the application claims 1 and 2 *supra*. The language so delineating the patent claims serves to characterize the stressed condition of the race member or ball seat [R. 520-523, 559].

The descriptions relating to stresses and stress tensions and compression and their location appearing in claims 1 and 2 of the patent were added by amendments in 1950 without objection by the Patent Office and they constitute descriptions which are inherent in the article produced by the method originally disclosed by Potter and serve in conjunction with the other language of claims 1 and 2 to describe an article which has not been made before and

is not suggested by any of the prior art to which reference was made [R. 1285].

In accordance with Finding LIX [R. 172], the claims of the '841 patent find a basis in the original disclosure to the Patent Office on July 23, 1945.

In accordance with Finding XIII [R. 159], the stress pattern in the race member defined in claims 1 and 2 of the '841 patent defines a physical condition of the race member and such stress pattern is instrumental in maintaining the ball frozen in the race member after the forming operation, such that substantially the entire available adjacent surfaces of the ball and its race member are in direct and intimate contact; and such stress pattern may be altered by the application of a relatively small force uniformly applied to the outer periphery of the race member to either uniformly liberate the ball from the race member or to achieve a uniform preload condition.

In accordance with Finding L [R. 169], the stress pattern in the race member claimed in claims 1 and 2 of the '841 patent and which results from the forming, swedging or coining operation disclosed in either the '841 or '172 patents, serves to characterize the condition of the race member and thus imparts a different physical property to the race member than, for example, the machined outer race member of the Messerschmidt bearing [PX-13]. Further, the formed race member having a unique uniform stress pattern throughout substantially all of its body, is responsible for a new coaction between the ball and the race member, *i.e.*, such stress pattern is responsible for the direct and intimate engagement between the ball and the formed race throughout substantially all of the entire available adjacent surfaces of the ball and the

race member in either the “frozen” condition or in a preloaded condition; and further such pattern is responsible for the obtainance of a controllable even and uniform clearance between the ball and its race member after the race member is subjected to rolling forces.

In accordance with Finding LII [R. 170], the stress pattern recited in claims 1 and 2 of the '841 patent imparts a physical characteristic to the formed race and is considered to be a “means” whereby the novel coaction recited in the next preceding paragraph results.

Finding LVII [R. 171] specifically states that the bearing claimed in Potter '841 is productive of a new and different function which involves the use of the stress pattern claimed therein to obtain the direct and intimate contact between substantially all of the entire available adjacent surfaces of the ball and formed race and particularly to obtain a preloaded bearing.

The '841 specification and drawings clearly describe the manner in which the race, originally in the form of a ring, is formed around the ball; and the stress pattern included in claims 1 and 2 is that pattern which is set up during the forming of the ring around the ball [R. 931, 1048].

The significance of the stress pattern included in the claims of the '841 patent is well illustrated in Barish's following analogy [R. 531]:

“If we were to put an elastic band tightly around the ball, it would be in tension. If we put a second band on top of that, the tension in the inner band would be reduced and the outer band would have more tension. And if we were to put on a number of bands, we would end up with the outer band in tension and the inner band in compression.

Now, the Potter operation is similar in a way to removing only the outer band. That would be relieving slightly the tension on the external skin, but it would produce a slight alleviation of the compression on the innermost band. That way with relatively small forces exerted (431) only on the outside we are able to produce extremely small even loosenesses between the sphere and the ring."

The evidence clearly establishes that the stress pattern is used to advantage in the liberating step [R. 521, 525, 532, 929, 930]; and there is not evidence to the contrary notwithstanding defendant's reference to Barish's testimony [R. 1122].

The term "unstretchable peripheral area" in claim 1 of the '841 patent has reference to the fact that the outer race member, while being stretchable by the application of a relatively small liberating force in the production of the bearing, is unstretchable in use, *i.e.*, under the very heavy loads and vibrational forces to which the article is subjected in use [R. 563]; and that the use of this expression finds adequate support in Potter's original disclosure in July 1945 [R. 522, 523, 565, 782, 363]. Contrary to defendant's contentions, Barish [R. 522] and Colwell [R. 782] and Hackman each have this same understanding of the term "unstretchable peripheral area."

Thus, the forming of the self-aligning bearings of the '841 patent according to the method of the '172 patent results in a condition in the race in which under the loads applied in subsequent use, the race will not be further stretched and this is defined in claim 1 of the '841 patent as forming an "unstretchable peripheral area" [Finding VIII, R. 157].

K. Claims in Potter Method Patent 2,724,172.

The claims of the Potter Patent 2,724,172 are reproduced in the Appendix. Claims 3 and 4 are typical claims. Claim 3 is reproduced below in extended form with comments in an adjacent column.

3. In the method of forming a self-aligning bearing having a bearing ball and a spherical bearing race formed from a race blank,

Object to be made is a commercially acceptable two-piece self-aligning bearing which is new and improved in comparison to other commercial self-aligning bearings such as Messerschmidt [PX-13], Heim [PX-12], Prentiss [PX-11] and which has the features defined in Findings VII, XIV, XVI, XVII, XXI, XXIV, XXV, XXVI, XXVII, XXVIII, XXIX, XLIII, XLVI, LVIII [R. 153].

the steps comprising:

While the invention in a method claim is defined by the steps performed, it is, of course, permissible to look at the end result, i.e. the bearing itself, in a determination of utility, novelty and unobviousness of the method. The fact that a different Division of the Patent Office found invention in the bearing itself, in the '841 patent, should in this case be some indication of invention in the method.

coining said race blank around said ball in intimate and direct contact with said ball to produce a binding action between said ball and race blank such that the outer periphery of the race blank is placed under a stretch tension and the inner periphery is compressed to conform evenly with the perimeter of the ball and to produce a longitudinally curved spherical perimeter,

This step is definitely new and incorporates novel teachings. This step clearly defines and is clearly limited to the condition that coining of the race blank is around *that* ball which remains as a part of the finishing bearing.

This is not so in Taylor since Taylor uses an auxiliary former die 9 which is later pushed out of the race to form a keyhole slot as in Messerschmidt [PX-13] for a ball which was not used in the forming operation.

This step is definitely not shown or suggested in either Chambers, Taylor or Fiegel for the simple reason that neither one contemplates a binding action.

In Heim, the race comprises a number of inserts between the ball and a holder and neither the inserts nor the holder is coined around the ball. In Hoern a ball is squeezed into the end of a hexagonal stud to form only one ball-retaining lip; and a longitudinal curved spherical perimeter is not produced since the stud remains hexagonal. Further, as in Heim, there is no favorable stress

pattern developed in Hoern which may be altered by the application of relatively small forces to produce a uniform clearance.

and then rolling the conformed race blank under sufficient pressure to relieve some of the compressive stresses in the inner periphery of said blank to elongate the bearing race evenly and permit smooth rotation between said ball and said bearing race but still confine said ball within said race.

This step is also definitely new and incorporates novel teachings. Rolling and hammering for these purposes are equivalent only when hammering is accomplished as described under heading I, *infra* to assimilate a rolling pressure. This step is limited to rolling the race. In Heim the race, *i.e.*, the inserts contacting the ball, are neither rolled nor do they have applied thereto hammer blows. Also, the force applied to the holder serves a different purpose, *i.e.*, it loosens the race inserts, does not stress-relieve them. Hoern prefers to use quenched heat to liberate a ball and his hexagonal stud, having six corners on its periphery, is not adaptable to the application of rolling forces or assimilated rolling forces.

The same comments are applicable to claim 4 of the '172 patent which is reproduced in a misleading manner on page 44 of defendant's Brief. Claim 4 is reproduced without

punctuation and one would get the impression that claim 4 calls for both a liberating step and a stress-relieving step, whereas in fact compressing the median portion of the [bearing race serves to relieve some of the compression stress.

L. Infringement.

The process employed by defendant in its manufacture of two-piece bearings does not differ in any essential respects from the process taught to Straub by Spangenberg, a former partner of Potter [Finding XI, R. 158, 939]. The Trial Judge visited both plaintiff's and defendant's plants during regular business hours and found that the method practiced and the bearing produced by plaintiff and defendant in each of their commercial productions are in accordance with the two patents in suit [Findings XXX, XVIII, R. 165]. The Trial Judge also found that the bearings described in the Colwell report [DX-L] are not representative of defendant's production [Finding XXXVI, R. 166].

In both plaintiff's and defendant's production an attempt is made to obtain as large an intimate and direct contact as possible between the ball and its race member during the forming operation and to obtain as large a uniform contact area as possible between the ball and race member after liberation [Finding XXXVIII, R. 167].

In the manufacture of defendant's bearings, a cylindrical race is placed about a spherical ball having flattened ends and such race is pressed into continuous contact with the ball and the race is then liberated from the ball by applying force to the outer periphery of the race by rolling the bearing between rollers or by hammering uniformly

around the circumference of the race [Finding XLIV, R. 168]. This is so with respect to bearings listed in defendant's catalog [PX-7], for example the HSB bearings [R. 491, 941], HSBG, KSBG, KWB, KLS, KSBY bearings [R. 497]. Defendant's catalog [PX-7] lists defendant's bearings which are interchangeable with plaintiff's bearings and these have substantially the same properties [R. 517, 890, 927]. Rolling bearings to loosen them is defendant's standard practice [R. 841].

M. Long Felt Want and Commercial Success.

The Potter invention has resulted in a new segment of the bearing industry which produces spherical swaged self-aligning bearings [R. 939].

The only other two-piece bearing being used is the Messerschmidt-type bearing [PX-13], but these bearings, because of their slotted race member, have limited uses.

Hackman's testimony clearly establishes that prior art bearings in practical use, such as the Messerschmidt bearing [PX-13], Heim Bearing [PX-12] and Prentiss bearing [PX-11], had well known defects and limitations and thus there was a long felt want for an improved bearing.

At the time Potter invented his bearing, many persons in the bearing field immediately recognized the value of the invention and formed the Halfco partnership. Many of the designations used by various companies today in designating their bearings such as HSB have reference to the Halfco spherical bearing.

This long felt want is established also in part by the Ryan order of February 1945 [R. 269, PX-19]. Ryan, after seeing the Potter bearing, changed its order from 12 to 2,012 bearings. The Trial Judge observed [R. 1287] that

Potter found a way for making a bearing for which there is still a great demand in the industry as indicated by defendant's catalog [PX-7] and the list therein of interchangeable bearings made by different companies.

III.

Summary of Argument.

The Findings of Fact of the Trial Court herein are not only supported by substantial evidence but, indeed, the record does not contain any evidence which would sustain any contrary findings.

Rule 52 of the Rules of Civil Procedure provides in part:

"Findings of fact shall not be set aside unless clearly erroneous and due regard shall be given to the opportunity of the trial court to judge of the credibility of the witnesses."

The Supreme Court in its recent decisions has emphasized that a court of Appellate Review must not disturb such findings unless the same are clearly erroneous.

Graver Tank & Mfg. Co., Inc. v. Linde Air Products Co., 336 U. S. 271, 93 L. Ed. 672;

Graver Tank & Mfg. Co., Inc. v. Linde Air Products Co., 339 U. S. 605, 94 L. Ed. 1097;

Goodyear Tire & Rubber Co., Inc. v. Ray-O-Vac Company, 321 U. S. 275, 88 L. Ed. 721.

This Court has in its recent decisions followed the rule that the Findings of the trial court where supported by substantial evidence should not be disturbed.

"The Court, by its above mentioned findings, determined two questions—the question of novelty and the question of invention. Both were questions of

fact. *Ralph N. Brodie Co. v. Hydraulic Press Mfg. Co.*, 9 Cir., 151 F. 2d 91; *Maulsby v. Conzevoy*, 9 Cir., 161 F. 2d 165. The findings are supported by substantial evidence, are not clearly erroneous and should not be disturbed."

Refrigeration Engineering, Inc. v. York Corporation, 168 F. 2d 896, 899, C. C. A. 9.

See also:

Faulkner v. Gibbs, 170 F. 2d 34, 37, C. C. A. 9;

Stauffer v. Slenderella, 254 F. 2d 127, C. C. A. 9.

The principal issues raised by defendant in its Brief involve the matter of invention. Defendant contends that the patents in suit do not disclose a patentable article or a patentable method for the alleged reason that it produces no new, surprising or unexpected results. In making this contention, defendant relies primarily on the decision of the Supreme Court in *Great A & P Tea Co. v. Supermarket Equipment Corporation*, 340 U. S. 147, 95 L. Ed. 162, and *Bergman et al. v. Aluminum Lock Shingle Corp. of America*, 251 F. 2d 801, C. C. A. 9. In these cases the sole novelty asserted in the combination of the elements of the patent resided merely in a change in dimension or the number of parts resulting in no new or different function or no new result or unusual or surprising consequences.

In the instant case the Trial Court has specifically found the new and surprising result called for by this test in its expressed detailed findings. These findings are fully supported in the record and on this issue, there-

fore, the case is governed by the rule set forth in such decisions as

Williams Mfg. Co. v. United Shoe Machinery Corp., 316 U. S. 362, 86 L. Ed. 1537;

Bianchi, et al. v. Barili, 168 F. 2d 793, C. C. A. 9;

Page, et al. v. Myers, 155 F. 2d 57, C. C. A. 9.

These decisions set forth that where the trial court has found the patent in suit to produce results of unusual and surprising circumstances which are supported by substantial evidence and not clearly erroneous, the findings that the patent in suit represents a new patentable combination should not be disturbed.

The trial court found that the Potter bearing and the method of making the same involves a different mode of operation and new and unexpected advantages over the prior art and concluded as a fact that the Potter bearing and method represented an invention.

On this issue the case is clearly governed by such decisions as *Goodyear Tire & Rubber Company, Inc., et al. v. Ray-O-Vac Company*, 321 U. S. 275, 88 L. Ed. 721, and *Oliver-Sherwood Co., et al. v. Patterson-Ballagh Corporation*, 95 F. 2d 70, C. C. A. 9; *Pointer v. Six Wheel Corporation*, C. C. A. 9, 177 F. 2d 153, which set forth the rule that where the patent in suit is shown to involve a new construction, new mode of operation and new and unexpected result, a patentable invention may be present and Findings of Fact on such issue by the lower court not clearly erroneous should not be disturbed.

Defendant contends that there is no infringement. The record, however, demonstrates that bearings made by defendant are an unscrupulous copy of the Potter bearing

and are made in accordance with Potter's method. The Supreme Court in its recent decision in *Graver Tank & Manufacturing Company, Inc. v. Linde Air Products Company*, 339 U. S. 605, 94 L. Ed. 1097, has expressly and most emphatically emphasized the rule that such an unscrupulous copyist should not be permitted to escape the charge of infringement.

There is no merit to any of the contentions set forth in defendant's Brief. When analyzed, they will all be found to be predicated on erroneous contentions of fact opposed not only to the Findings of Fact of the lower court but the overwhelming evidence in the record.

IV.

Argument.

A. The Potter Bearing Incorporates a Novel Element Functioning in a Novel Manner to Achieve a New and Improved Bearing.

Although simplified to only the bare essentials of a ball and its seat (race ring), the Potter self-aligning bearing incorporates a novel element, *i.e.*, ball seat, functioning in a novel manner with the ball to achieve a new and improved result. While simplification in and of itself does not constitute invention, it is a factor to consider in determining an invention. *Stauffer v. Slenderella Systems of California*, 254 F. 2d 127. Under this heading we are concerned with the "means" responsible for such simplification.

At the outset there should be no doubt that the Potter invention resulted in a new simplified and improved self-aligning bearing having new and improved features [Findings IV, XIV, XVI, XVII, XIX, XX, XXI, XXIV,

XXV, XXVI, XXVII, XXVIII, L, LII, LVII, LVIII, R. 155].

The new element in the Potter bearing is the continuous race ring which forms the ball seat and which is uniformly stressed. The stress pattern in the ball seat (race member) claimed in the '841 patent and which results from forming, swedging or coining a ring around a ball as disclosed in either the '841 or '172 patents, serves to characterize the condition of the ball seat and thus imparts a different physical property to the race member than, for example, the machined outer race member of the Messerschmidt bearing [P-13, Finding L, R. 169]; and additionally the Potter Ball seat is *continuous*, *ie.*, devoid of any slots which, as in the Messerschmidt bearing [PX-13] and Taylor Patent 2,382,349 [R. 1402], are required to be formed to allow the bearing ball to be inserted. Potter teaches that his ball seat (race ring) should be (1) *continuous*; (2) formed to establish a uniform stress pattern; (3) that such stress pattern after forming should not be disturbed by cutting slots in the side of the ring as is necessary on the Messerschmidt bearing [PX-13] or Taylor 2,382,349 [R. 1402]; but that (4) such stress pattern should be produced uniformly and maintained uniformly and advantage taken of such uniform stress pattern to control the clearance between it and the bearing ball which, also contrary to Taylor 2,382,349, is used as a die member itself [Finding XV, R. 159]. Thus, the novel element which Potter has contributed to the bearing art is a *continuous* race ring having a substantially uniform stress pattern therein which results from the forming operation disclosed in the '841 patent. This stress pattern in accordance with other teachings of Potter allows the race ring to be

used as the ball seat itself without the necessity of slotting the race ring and hence destroying such stress pattern. In other words, Potter establishes and continues to maintain a stress pattern which he uses for advantageous purposes [Finding VII, R. 157]. The stress pattern which is produced and maintained is responsible for a different coaction between the ball and its race ring [Findings XIII, XVII, XX, XXVII, XXXV, L, LI, LII, LVII]. These findings are supported by Barish's uncontroverted testimony.

The evidence clearly shows that when rolling pressure is applied to the race, the race spreads in all of those directions set forth in the '841 patent.

Finding II is reconcilable with the other detailed Findings when one makes an earnest attempt to do so. The keyword in Finding II is the word "controllable." This clearance is controlled during the liberation or loosening step. The words "very small . . . clearance" in Finding II are comparable to the "'zero' clearance" specified in the other Findings such as Finding XX.

"Doubt as to patentability of patented article, filling new want, entering into immediate use, meeting with pronounced commercial success, and imitated by another, should be resolved in favor of validity of patent."

Black & Decker Mfg. Co. et al. v. Baltimore Truck Tire Service Corporation, C. C. A. 4, 40 F. 2d 910.

In determining whether invention exists in a given device, courts should guard against over-simplification

through a hindsight view of the problem as originally encountered.

Bernard Joseph Mumm v. Jacob E. Decker & Sons,
301 U. S. 168, 171.

The failure of mechanics to improve a device in common use for a long time is good evidence of invention.

Potts v. Crager, 155 U. S. 597.

An excessive number of prior art references is in itself persuasive of futility of prior attempts to solve the problem.

Ric-Wil Co. v. E. B. Kaiser Co., 179 F. 2d 401,
C. C. A. 7.

Defendant's imitation of the patent structure is another indication of invention.

Ric-Wil Co. v. E. B. Kaiser Co., 179 F. 2d 404,
C. C. A. 7.

Judge Learned Hand noted in *Grand Rapids Showcase Co. v. Straus et al.*, 229 Fed. 200:

“. . . it is obviously preposterous to suppose that the invention has actually been patented anything like the number of patents here pleaded.”

B. The Potter Method Incorporates Novel Steps and a Novel Combination of Steps for Achieving a New and Improved Bearing.

While the number of steps involved in the Potter method are few, nevertheless novelty is present in these steps individually and in combination; and the same involve novel teachings.

One of the important novel steps and concepts involves coining, forming or compressing the race ring itself about

the bearing ball itself *to bind the bearing ball in the race*. In this respect, contrary to defendant's indications on page 44 of its Brief, the Taylor race ring is *not formed about that ball which is ultimately a part of the bearing* but an auxiliary forming die 9 in the Taylor patent is used, such forming die being later rotated in the ring 5 and later driven through the side wall of the race ring to form a keyhole-type slot as in the Messerschmidt bearing [PX-13] and to incidentally destroy the stress pattern and, indeed, to produce "a miserable looking mess" [R. 636]. Also, contrary to defendant's indications, Taylor's race ring is not compressed so as to be bound to the auxiliary forming die since otherwise this die could not be rotated. Also, contrary to defendant's indications, the Chambers and Fiegel race members are not so formed about a ball so as to produce a binding engagement around the curved surface of the ball. Also, contrary to defendant's indication, Heim does not compress the bearing race since in Heim those members which contract the ball are inserts and these are loosened by applying blows to an external holder.

A second important and novel step involves loosening of the bearing ball once it has been bound in its race member by the application of either a rolling force or successive forces assimilating rolling forces to the curved perimeter of the race member. Taylor is not concerned with loosening since his forming die 9 is sufficiently loose to permit it to be rotated to the position shown in Figure 5 therein. Chambers and Fiegel do not show, suggest or teach binding of the ball. In Heim any binding of the ball is of an accidental nature which occurs when the race member, comprising a plurality of inserts are jammed between the ball and outer holder. The Heim holder is not

a race member, *i.e.*, a bearing seat for the ball, and loosening forces are not applied directly to the inserts, *i.e.*, race, but to the holder.

C. Unobviousness of Potter's Invention Under 35 USC 103.

The condition for patentability as expressed under Section 103 is that the subject matter as a whole would not have been obvious at the time the invention was made to a person having ordinary skill in the art to which such subject matter pertains. One good reason for patentability under Section 103 is that Straub, present Manager of the Kahr Bearing Division of defendant, had experiences which qualify him as a person really having more than ordinary skill in the art yet he was required, prior to issuance of the Potter patents, to be taught the invention by one of Potter's former partners, Spangenberg [Finding X, R. 158]. Straub had been a tool maker for 40 years [R. 957] and had worked with forming dies [R. 956] and had occasion very often to loosen an outer metallic member that held an inner member [R. 957]. How can defendant now say that the Potter inventions are not patentable on the basis of Section 103 when its motivating power, Straub, prior to issuance of the '841 patent and after 40 years of experience as a tool maker, die maker, punch maker, experimental engineer and job shop operator, was required to be taught how to make the Potter bearings by Potter's former partner and die maker [Findings X, XI, XII, R. 158]?

The Taylor Patent 2,382,349 [R. 1402] serves as an excellent example of the elusiveness and unobviousness of the Potter invention. Taylor actually coins a race ring around a ball-shaped forming element (not the finished

bearing ball) and by doing so achieves a stress pattern in his race ring of the kind developed by Potter. However, it did not occur to Taylor that a bearing could be produced by actually binding the ball and then using such stress pattern to advantage but on the contrary, Taylor destroys such stress pattern by pressing the forming ball out of the race member to produce keyhole slots in the race member. At best, Taylor's finished bearing is a Messerschmidt bearing with its attendant disadvantages.

D. The '172 Patent Is Entitled to the Filing Date of the '841 Patent.

The fact that bearings were made under this '841 patent prior to October 8, 1951 does not invalidate the '172 patent. The '172 patent was applied for as a division of the '841 patent and was so issued. This is so stated in the '172 patent [R. 1300] as follows: "Original application July 23, 1945, Serial No. 606,678, now Patent 2,626,841 dated January 23, 1953. Divided and this application December 16, 1952, Serial No. 326,294."

At the time Potter made oath to his application Serial No. 326,294 which matured as the '172 patent, such application to which he subscribed an oath contained a specific reference to his original and still pending application Serial No. 606,678 [DX-B] which later matured as the '841 patent. That was all that was necessary in order for the '172 application to have the benefit of the filing date of the '841 application. This is so in accordance with the specific title and provisions of 35 U. S. C. 120 reproduced in the Appendix.

Applying the specific provisions of Section 120 to the '841 and '172 applications, the specifications in the '841 and '172 applications each clearly contain a written description

of the same method which is the subject of each of the claims of the '172 patent. All of such claims in the '172 patent are readable on the disclosure in the '841 patent [Finding LIV, R. 171]. The '172 application was filed on December 16, 1952 prior to issuance of the '841 patent; and the '172 application continuously made a specific reference to the earlier filed '841 application. The above showing in and of itself is sufficient to show Potter's compliance with Section 120. *Crown Cork and Seal Company v. Ferdinand Guttman Company*, 304 U. S. 159; *Wire Tie Machinery Co. v. Pacific Box Corporation*, 102 F. 2d 543, C. A. 9). Plaintiff need go no further in establishing that the '172 patent is entitled to the filing date of the '841 patent.

There are, however, other facts which clearly negate any inference that Potter contemplated abandoning claims to the method; and for this latter purpose, reference is made to Potter applications Serial No. 767,496 [DX-C] and Serial No. 135,174 [PX-2A], both of which are included as additional material in Chart I. Potter application Serial No. 135,174 was filed during the pendency of his application Serial No. 767,496 [DX-C] and contain method claims. These method claims were pending before the Patent Office in the time interval between October 1, 1951 and December 16, 1952. Later, during the prosecution of the '975 application Serial No. 135,174 [PX-2A], method claims were transferred into the '172 application.

At the time the method claims were cancelled from the '841 application as a result of the patent Office requirement for division, it should be clear that there was no intention to abandon the method claims in view of the

fact that the Potter application Serial No. 767,496 [DX-C] was filed within the six months' period allowed for amendment of the '841 application.

A clear distinction should be made between abandonment of an application and abandonment of an invention. Abandonment of an application in favor of another co-pending application negates any intention of abandoning the method claims of the invention. Application Serial No. 767,496 [DX-C] was abandoned in favor of Application Serial No. 135,174 which at that time contained method claims like those of application Serial No. 767,496.

Thus, any prior use that would invalidate the '841 or '172 patents would have had to be accomplished before July 23, 1944; and there is absolutely no showing of any such prior public use before July 23, 1944.

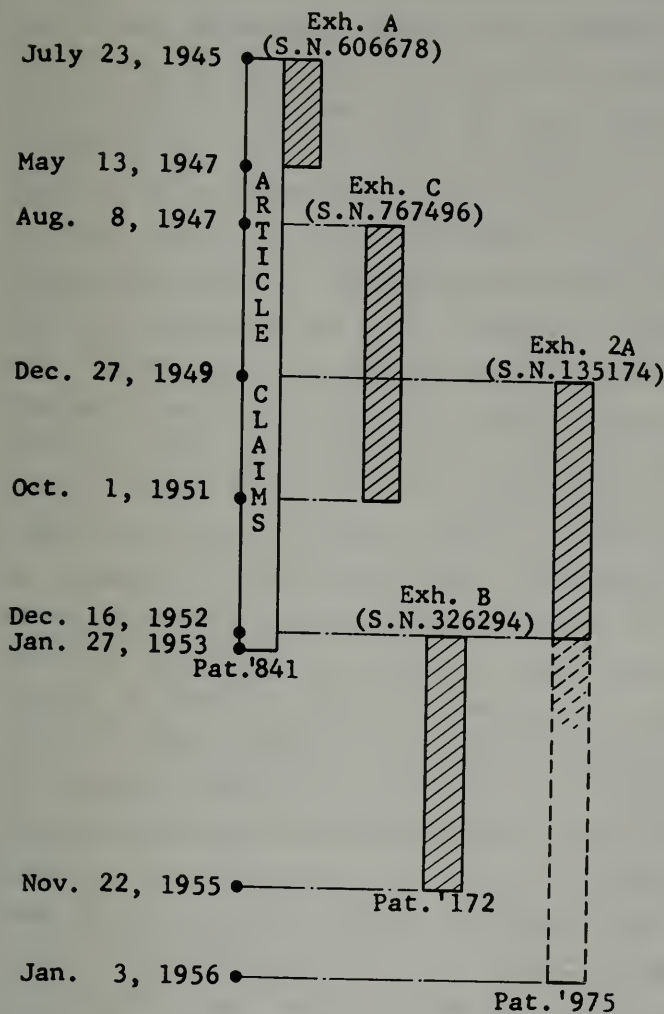
It was not necessary and no duty whatsoever, moral or otherwise, was imposed on Potter to inform the Patent Office of any public use in 1951 when the '172 patent was filed, since the '172 patent is entitled to the July 23, 1945 filing date. There can be no concealment when there is no duty, moral or otherwise, to disclose facts that are really not pertinent. The first disclosure of the method was made and claimed in the Patent Office on July 23, 1945, and the Patent Office is not concerned at all as to when public use is made of an invention subsequent to its filing date. Indeed, any oath in a divisional application is unnecessary and surplusage. This should be clear from the express provisions of Section 121 stating "If a divisional application is directed solely to subject matter described and claimed in the original application as filed, the Commissioner may dispense with signing and execution by the

inventor.” Section 121 in its entirety is set forth in the Appendix.

The fact that an appeal is dismissed in the Patent Office does not establish abandonment of the invention, particularly as in this instance where Potter elected to prosecute like method claims in his copending application Serial No. 135,174 [PX-2A]. Abandonment of an application is certainly not conclusive as to whether the invention being claimed therein is abandoned also. Section 120 allows proceedings to be abandoned without abandonment of the invention.

Abandonment involves a question of intention; and it was Potter's intention not to abandon the invention [Finding LV, R. 171] and such intention was actually carried out by him in maintaining like method claims in Serial No. 135,174 and also further by filing application Serial No. 326,294 which matured as the '172 patent. No delay was encountered in inserting or prosecuting method claims since such method claims were already being inserted in application Serial No. 135,174 [PX-2A] and also the original application Serial No. 606,678 [DX-A] in method claims were initially introduced was still pending.

There has never been an intention to abandon the method claims of the invention. Contrary to defendant's contention, method claims were continuously presented to the Patent Office by Potter from the filing of the original application on July 23, 1945 to the issuance of the '172 patent with the exception of a short fully excused time interval extending from May 13, 1947 to August 8, 1947. Chart 1 clearly shows this to be so.



Article Claims ☐

Method Claims ☒

CHART 1

1871



1871

Chart 1 illustrates the times during which the various Potter applications, Serial No. 606,678, Exh. A; Serial No. 767,496, Exh. C; Serial No. 135,174, Exh. 2A; Serial No. 326,294, Exh. B, were pending in the Patent Office. With reference to Serial No. 606,678, Exh. A, it was filed on July 23, 1945 and matured as the '841 patent on January 27, 1953. During its pendency both article and method claims were presented and this is indicated by the clear rectangle designated "Article Claims" and the adjacent hatched rectangle. This hatched rectangle indicates that method claims were presented in Exh. A during the time interval January 23, 1945 to May 13, 1947. Such method claims were cancelled from Exh. A without prejudice on May 13, 1947, in response to the Patent Office requirement for division; and a divisional application Serial No. 767,496, Exh. C, containing such method claims was filed on August 8, 1947. During the pendency of application, Exh. C, Potter filed an additional application Serial No. 135,174, Exh. 2A, on December 27, 1949 containing method claims and this application subsequently matured as the '975 patent on January 3, 1956. At the time Exh. C was still pending, the Patent Office had before it claims being presented by Potter to the method in Exh. 2A. Such method claims 2, 3, 4, 5 appear not only in Exh. 2A but also in the Pre-Trial Order [R. 116-117]. These claims 3, 4 and 5 were amended on July 23, 1952 to appear not only as shown in Exh. 2A but also as shown in Pre-Trial Order [R. 118, 119]; and as so amended are directed to the method of making the bearing which is being claimed in Exh. A. These claims 3, 4 and 5 were pending in the Patent Office between

December 27, 1949 to a later date which is subsequent to December 16, 1952, the filing date of the '172 application, Exh. B.

Potter, on filing Exh. B, had two pending applications, Exh. B and Exh. 2A, directed to the method of making the bearing being claimed in Exh. A; and Potter later made Exh. B the sole application for the method of making the bearing of Exh. A while restricting Exh. 2A in a manner which is of no interest here.

With respect to defendant's contention that the claims of the '172 patent find no basis in the '841 application, defendant's witness Colwell [R. 1448] stated "This citation again emphasizes the importance of 'coining' as was done earlier in the inventor's Patents 2,626,841 and 2,724,172." Barish's testimony clearly shows that the '172 claims find a basis in the '841 disclosure and such testimony was not controverted at the trial.

E. The Question of New Matter.

The language of the claims in both the '841 and '172 patents finds clear basis in the '841 application. Barish's testimony establishing this point stand uncontroverted and is also in accordance with the determinations made independently by two different Divisions, namely Divisions 14 and 45, in the Patent Office.

"the Patent Office has a strict rule on this subject. It fully recognizes that new matter must not be permitted, and it is constantly engaged in defining what is and what is not new matter. The

application of the rule must, of necessity, be more or less arbitrary, and the presumption of correctness which attends Patent Office rulings must apply with especial force to this class of ruling; . . .”

General Electric Co. v. Cooper Hewitt Electric Co., C. C. A. 6, 249 Fed. 61.

“The fact that the Patent Office granted the patent in suit necessarily means that it did not consider the amendments to the application as ‘new matter’ within the meaning of its rules or of the Act. Since the Patent Office is constantly determining and defining what is or what is not new matter, its ruling on such questions is entitled to special weight.”

Helms Products, Inc. v. Lake Shore Mfg. Co., Inc., 227 F. 2d 677, C. C. A. 7.

“. . . the patentee is entitled to have the claims of his patent construed with reference to the drawings and specifications.”

Wire Tie Machinery Co. v. Pacific Box Corporation, C. A. 9th, 107 F. 2d 54.

“As the Court of Appeals for this Circuit indicated in *Engineering Development Laboratories v. Radio Corp. of America*, 153 F. 2d 523 (68 USPQ 238) (C. C. A. 2, 1946), claims may be amended without affecting their validity if the alterations can be supported by a reasonable interpretation of the original disclosures.”

Helene Curtis Industries, Inc. v. Sales Affiliates, Inc., 121 Fed. Supp. 490.

“ . . . we see no objection to the entry of an amendment stating their utility which is an inherent property possessed by such compounds.”

Ex parte Harman, Patent Office Board of Appeals, 86 USPQ 487.

“However, this inherent quality of rubber can be stated at any time without the charge of ‘new matter’.”

Ex parte Bletcher et al, Patent Office Board of Appeals, 52 USPQ 262.

An applicant for patent need not submit a new oath each time a claim is amended.

This Court in *Wire Tie Machinery Co. v. Pacific Box Corporation*, C. A. 9th, 102 F. 2d 543, quoted the following language from *Westinghouse Electric & Mfg. Co. v. Metropolitan Electric Mfg. Co.*, C. A. 2, 290 Fed. 661, 664,

“Changes of language, not changing the substantial meaning as it stood before amendment, and even changes of meaning, narrowing the scope of the invention described, do not infringe the statute.

* * * * *

“Result is that a claim fairly derivable from a sworn disclosure is good, whether originally presented or introduced by amendment; and such claim needs no supplemental oath.”

An application which is a divisional application requires no oath. 35 U. S. C. 121 (Appendix).

F. Muncie Gear Case.

Muncie Gear Co. v. Outboard Co., 315 U. S. 759, involved delayed claiming of new matter. In the present case there was no delayed claiming and also there is no new matter.

Potter in his '841 application, continuously from its filing presented claims to the same combination, namely a ball and a race member, and the issued claims are to this combination. The language added to the claims served solely to more clearly delineate the combination of a ball and its race member. Neither the specification nor the drawings in the '841 application was amended (only hatching being added to the drawings to satisfy a requirement of the Patent Office); and the uncontroverted evidence is that such language more clearly delineating the combination finds a clear basis in the original disclosure made to the Patent Office on July 23, 1945.

Potter in the '172 application continued to prosecute claims to the same method which was disclosed and claimed in claims 3 and 4 of the original '841 application [DX-A].

It is permissible to make changes in the specification and scope of the claims as long as there is a basis in the original disclosure.

Harries et al. v. Air King Products Co., Inc.,
C. C. A. 2, 183 F. 2d 158.

The Cold Metal Process Company, et al. v. Republic Steel Corporation, C. C. A. 6, 233 F. 2d 828, involved a divisional application of 1928 based on a parent application filed in 1923. The court found the combination disclosed by the 1923 application to consist essentially of the

same elements claimed in the later application and held the later application valid.

See also:

Coats Loaders and Stackers, Inc. v. Henderson et al.;

Teegarden et al. v. Big Four Industries Inc.,
C. C. A. 6, 233 F. 2d 915.

Mastercrafters Clock and Radio Co. v. United Metal Goods Mfg. Co. Inc. and United Clock Corp., U. S. D. C. E. D. New York, 138 Fed. Sup. 388.

- G. The Claims of the '841 and '172 Patents Are Supported by the Specification and Drawings as Filed on July 23, 1945 and the '841 Patent Covers an Article of Manufacture, Not a Law of Nature or Stresses.**

The sufficiency of the specification and drawings in the originally filed '841 application is to be tested by Section 112 of Title 35 which provides in part that the specification shall contain a written description of the invention so as to enable a person skilled in the art to which it pertains, to make and use the same. Section 112 further provides that the specification shall conclude with one or more claims, particularly pointing out and distinctly claiming the subject matter of the invention.

The courts clearly recognize that the disclosure is directed to one skilled in the art and its sufficiency is determined from that viewpoint. Thus, the court in *S. D. Warren Co. v. Nashua Gummed and Coated Paper Co.*, C. C. A. 1, 205 F. 2d 602, stated:

"He (the patentee) described the essence of his invention in detail and particularity in his specification . . . reading the claims in the light of the specifi-

cation, we think one skilled in the art could readily comprehend the precise nature of Perry's invention and the limits of its scope. This is all the law requires."

Defendant refers to such words as stressed, compressed, tensioned and stress relieved. These words have a clear and definite meaning to those skilled in the art and are clearly supported in the specification in a manner understandable to those skilled in the art. The witnesses had no difficulty in understanding these and like terms in relation to Potter's original disclosure.

The stress pattern defined in claims 1 and 2 of the '841 patent cannot, of course, exist in a vacuum but require the claimed race member to sustain it. By the same token, the invention of the article defined by these claims cannot be considered to be *solely* such stress pattern but the invention is in the combination of elements set forth therein including as a novel element thereof a ball race having the defined stress pattern. Thus, the language cited by defendant in *Schriber-Schroth Co. v. Cleveland Trust Co.*, 311 U. S. 211, is not applicable for the reason that plaintiff is not attempting to reconstruct claims to either include unexpressed limitations or to exclude expressed limitations.

The descriptions relating to stresses and stress tensions and compressions and their location in the ball race constitute descriptions of the ball race itself after the same has been formed around the ball and serve in conjunction with the other language of claims 1 and 2 to define a new article. An article so defined exists after the forming operation with the ball non-rotatably held by the ball race.

The Trial Judge so indicated [R. 1288, 1289]; so did Barish [R. 932]; and Potter, during prosecution of the '841 application [DX-A, p. 4], also so indicated. The evidence also shows that this stress pattern so defined in the claims of the '841 patent is not destroyed by the liberation process after which the ball has either slight preloading or is more free to move; and this is also in conformity with Barish's analogy to rubber bands.

H. Infringement.

The evidence clearly established that defendant places an annular ring around a ball, and press-forms, coins or swedges the ring around the ball to produce such direct and intimate contact between the two to bind the ball in the race. Straub testified that tests using blued grease show that the degree of binding contact between the ball and race is approximately 60 to 65 per cent and may be as high as 80 per cent [R. 1150, 1058, 1119]. However, the degree of intimacy as established in tests depends upon the particular test employed [R. 1061]. The major portion of the ring in both plaintiff's and defendant's manufacture has such direct and intimate contact that causes binding [R. 1062]. Please bear in mind also that in the manufacture of these bearings the ring in its original form has its ends chamfered and these chamfered ends, when subsequently formed around the ball, define a small space into which feeler gauges may be inserted [R. 482], making it difficult to ascertain whether or not there is actually any clearance between the ball and unchamfered portion of the race [R. 818]. The evidence also clearly establishes that a bearing assembly so formed includes a race member having an advantageous stress pat-

tern which is used during the subsequent liberation process by both plaintiff and defendant to produce a uniform and controlled clearance.

I. Costs on Appeal.

Defendant complains that plaintiff has burdened the record with unnecessary material. Much of the material designated by plaintiff is in support of (1) completion of the invention by Potter prior to the filing dates of the Spangenberg and Paulus et al. patents; (2) long felt want and acceptance by the public; and (3) commercial success. Also, since defendant has stated in its "Points on Appeal" [R. 178] that the Trial Judge "did not understand the subject matter of the patents in suit" and has indicated that defendant did not receive a fair trial, plaintiff deemed it best to order printing of the entire Transcript of Record.

In support of its position that defendant did not receive a fair trial, defendant indicates that the Trial Judge favored testimony from Barish over that offered by Colwell.

Barish candidly admitted that he was not an expert in photo-elasticity but he qualified excellently as an expert on bearings. Barish was asked on cross-examination to explain a "fourth order fringe" with respect to Exhibit 55, yet there is no testimony in the record that Exhibit 55 contains a fourth order fringe. Certainly Barish did not testify that Exhibit 55 contained a fourth order fringe. One using tools as a part of his profession is not necessarily an expert in the production of such tools. Thus, for example, an expert radiologist is not necessarily an expert in the understanding of the mechanisms involved in making X-ray photographs.

V.

Conclusions.

It is respectfully submitted that Potter patents in suit, Nos. 2,626,841 and 2,724,172 are as found by the District Court valid and infringed; that the findings of the District Court are completely substantiated by the evidence and, in fact, the evidence would support no contrary findings; that none of the prior patents cited by the defendant and no combination thereof anticipates any of the claims in suit; and that the technical defenses attempted to be raised by the defendant-appellant are based on misconceptions of the evidence and of the applicable rules of law.

The Judgment of the District Court was in all respects correct and should be affirmed.

Respectfully submitted,

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Attorneys for Plaintiff-Appellee.



APPENDIX.

Pertinent Sections of 103, 112, 120 and 121 of Title 35, U. S. C.

§103. CONDITIONS FOR PATENTABILITY; NON-OBVIOUS SUBJECT MATTER

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

§112. SPECIFICATION

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claims shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

§120. BENEFIT OF EARLIER FILING DATE IN THE UNITED STATES

An application for patent for an invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States by the same inventor shall have the same effect, as to such invention, as though filed on the date of the prior application, if filed before the patenting or abandonment of or termination of proceedings on the first application or on an application similarly entitled to the benefit of the filing date of the first application and if it contains or is amended to contain a specific reference to the earlier filed application.

§121. DIVISIONAL APPLICATIONS

If two or more independent and distinct inventions are claimed in one application, the Commissioner may require the application to be restricted to one of the inventions. If the other invention is made the subject of a divisional application which complies with the requirements of section 120 of this title it shall be entitled to the benefit of the filing date of the original application. A patent issuing on an application with respect to which a requirement for restriction under this section has been made, or on an application filed as a result of such a requirement, shall not be used as a reference either in the Patent Office or in the courts against a divisional application or against the original application or any patent issued on either of them, if the divisional application is filed before the issuance of the patent on the other application. If a divisional application is directed solely to subject matter described and claimed in the original application as filed, the Commissioner may dispense with signing and execution by the inventor. The validity of a patent shall not be questioned for failure of the Commissioner to require the application to be restricted to one invention.

Copy of Claims 1 and 2 of Potter 2,626,841.

1. A self-aligning bearing construction involving inner and outer bearing members, said inner bearing member comprising a bearing ball having a spherical bearing surface and an axially disposed bore for receiving a shaft, a non-ferrous malleable metal single piece outer bearing race member having a spherical socket corresponding in shape to the spherical inner bearing member and having parallel radial end walls, said outer race member being stressed such that the metal adjacent the inner peripheral surface area is compressed and the metal adjacent the outer peripheral surface is under a stress tension to form an unstretchable peripheral area which, when subjected to a rolling pressure, will cause the metal adjacent the inner peripheral surface to expand the ends of said outer bearing member in a direction away from the axis of the self-aligning bearing.

2. A self aligning bearing construction involving inner and outer bearing members, said inner bearing member comprising a bearing ball having a spherical bearing surface, a malleable single piece outer bearing race member having a spherical socket corresponding in shape to the spherical inner bearing member, said outer race member being stressed such that the metal adjacent the inner peripheral surface area is compressed and the metal adjacent the outer peripheral surface is tensioned.

Copy of Claims 1-7 of Potter 2,724,172.

1. The method of forming a self-aligning bearing having a bearing ball and relatively soft, ductile metal bearing race, said ball and race being formed with corresponding curved surfaces therebetween, comprising: assembling said ball in an annular blank having an inner cylindrical surface substantially corresponding in diameter with that of the bearing ball and having opposite end portions, compressing said end portions inwardly in intimate and direct contact with said ball to deform the cylindrical blank and place the same under a stress with the outer periphery stretched and the inner periphery under compression such that said blank will conform and produce a binding engagement around the curved surface of said ball, and finally compressing the median portion of the bearing race by pressure applied through rolling contact relieving some of the compression stress in the metal adjacent the inner periphery of said blank and elongating the bearing race evenly towards its opposite ends and separating evenly the bearing surfaces between the bearing ball and bearing race by an amount sufficient to permit smooth rotation therebetween but still confine said ball within said race.

2. The method of forming a self-aligning bearing having a bearing ball of hard material and a spherical bearing race of relatively soft, ductile material in which said ball is retailed and journaled, comprising: assembling said ball in an annular bearing race blank having an inner cylindrical surface substantially corresponding in diameter with the diameter of the ball and having oppositely disposed radially converging ends, compressing said converging ends inwardly in intimate and direct contact with said ball to deform the cylindrical blank and place the same under a stress such that the outer periphery will be placed under a stretch tension and the inner periphery will be compressed to conform evenly with the perimeter of said ball and produce a longitudinal curved perimeter, and finally

rolling the median portion between the ends of the bearing race inwardly under sufficient pressure relieving some of the compressive stress in the inner periphery of said blank and elongating the bearing race evenly to permit smooth rotation between said ball and bearing race but still confine said ball within said race.

3. In the method of forming a self-aligning bearing having a bearing ball and a spherical bearing race formed from a race blank, the steps comprising: coining said race blank around said ball in intimate and direct contact with said ball to produce a binding action between said ball and race blank such that the outer periphery of the race blank is placed under a stretch tension and the inner periphery is compressed to conform evenly with the perimeter of the ball and to produce a longitudinally curved spherical perimeter, and then rolling the conformed race blank under sufficient pressure to relieve some of the compressive stresses in the inner periphery of said blank to elongate the bearing race evenly and permit smooth rotation between said ball and said bearing race but still confine said ball within said race.

4. The method of forming a self-aligning bearing having a bearing ball and a relatively soft, ductile metal bearing race, said ball and race being formed with corresponding curved surfaces therebetween, comprising: assembling said ball in an annular blank having an inner cylindrical surface substantially corresponding in diameter with that of the bearing ball and having opposite end portions, compressing said end portions inwardly in intimate and direct contact with said ball to deform the cylindrical blank and place the same under a stress with the outer periphery stretched and the inner periphery under compression such that said blank will conform and produce a binding engagement around the curved surface of said ball, and finally compressing the median portion of the bearing race by pressure applied radially inwardly thereto reliev-

ing some of the compression stress in the metal adjacent the inner periphery of said blank and elongating the bearing race evenly towards its opposite ends and separating evenly the bearing surfaces between the bearing ball and bearing race by an amount sufficient to permit smooth rotation therebetween but still confine said ball within said race.

5. The method of claim 4 wherein said blank is initially formed with annular end surfaces of frusto-conical configuration such that pressing said opposite end portions of said blank inwardly into contact with said ball causes said annular end surfaces to become substantially parallel planar surfaces.

6. In the method of forming a self-aligning bearing having a bearing ball and a spherical bearing race formed from a race blank, the steps comprising: coining said race blank around said ball in intimate and direct contact with said ball to produce a binding action between said ball and race blank such that the outer periphery of the race blank is placed under a stretch tension and the inner periphery is compressed to conform evenly with the perimeter of the ball and to produce a longitudinally curved spherical perimeter, and then applying sufficient pressure radially inwardly to said race blank to relieve some of the compressive stresses in the inner periphery of said blank and elongating the bearing race evenly an amount sufficient to permit smooth rotation between said ball and said bearing race but still confine said ball within said race.

7. The method of claim 6 wherein said blank is initially formed with opposite end portions, each having an annular end surface of frusto-conical configuration such that coining said opposite end portions of said blank inwardly into contact with said ball causes said annular end surfaces to become substantially parallel planar surfaces.

PLAINTIFF'S EXHIBITS

Description	Page References in Record			
	Identified	Offered	Received	Attached
1 Potter Patent '841	187	187	187	215
2 Potter Patent '172	187	187	187	219
2-A File Wrapper of Pat. '975	188 & 772	773	773	
2-B Potter Pat. '975	188 & 773	773	773	1306
3-A Old Style Bearing Mfg. by Pltf.	191	192	192	
3-B Standard Bearing Mfg. by Pltf.	191	192	192	
4-A Bearing - Kahr HSBG-10	192	300	300	
4-B Bearing - Halfco HSB-10-SS	192	300	300	
7 Kahr Catalog 55	325	325	325	
7-A Kahr 1952 Catalog in effect prior to Kahr Catalog 55	325	326	404	
11 Prentiss Rod End	189	253	253	
12 Heim Bearing	189	319	319	
13 Messerschmidt Bearing	190	317	317	
14 Bearing - PBR	194	311	312	
15 Notice of Shipment Dated 2/17/45	260 261	263	263	1311
16 Shipping Memo Dated 1/22/43	263	264	264	1312
17 Packing List Dated 1/23/45	265	265	265	1313
17-A Blueprint No. B-10051 - 3/2/45	278	280	280	1314
18 Purchase Order Dated 1/15/45	260	267	267	1315
19 Purchase Order Change Notice Dated 2/12/45	269	270	270	1316
20 Packing List Dated 2/13/45	270	271	271	1317
21 Blueprint B-10090 - Stearns Rod End	282	282	282	1318
22 Blueprint B-10100 - Stearns Rod End	284	284	284	1319
23 Upper and Lower Dies	285	290	290	
24 Bearing Assy.	285	290	290	
25 Pltf's Catalog	295	296	296	
26 Envelope Wrapping for Pltf's Bearing	320	320	322	
27 S. W. Catalog No. 551	322	325	325	
28 Douglas Blueprint No. 3511900	326-7	333	335	1320
29 Douglas Blueprint	333	333	335	1321
0 A-D Photographs of Tolerancing Machine of S. W. Prods.	345	1188	1188	1322-1325

Description	Page References in Record			
	Identified	Offered	Received	Attached
31 Bearing - Ball Loose	351	351	352	
32 Bearing - Ball Moves Radially	351	351	352	
33 Bearing - Ball Can be Turned by Hand	352	352	352	
34 Bearing - Tight Ball	353	353	358	
35 Bearing - Immovable with Stainless Steel Race	355	358	358	
36 Bearing - Movable with Stainless Steel Race	355-6	358	358	
37 Bearing - Stainless Steel	356	358	358	
38 Bearing - Tight	356	358	358	
39 Purchase Order Dated 12/15/45	437	438	439	1326
40 Packing List Dated 3/16/45	439	440	440	1327
41 Packing List Dated 3/26/45	440	441	441	1328
42 Packing List Dated 3/31/45	441	441	441	1329
43 Purchase Order Dated 1/17/45	442	442	443	1330
43-A Copy of Letter of 1/26/45 by Hackman	442	442	443	1331
44 Douglas Blueprint No. Z3511851 - 1/17/53	443	444	444	1332
45 Pltf's Bearing - Preloaded	448	452	452	
46 Pltf's Bearing - Preloaded	448	452	452	
47 Bearing Submitted by Straub	478	479	479	
48 Kahr Bearing	478	479	479	
49 Halfco Blueprint Dated 11/30/55	479-80	481	481	1333
50 Blueprint - Kahr HSB - 3 Swage Die	479-80	481	481	1334
51 Liberated Bearing - HSBG-12S	483	489	489	
52 Unliberated Bearing - HSBG-12S	483	489	489	
53 Unassembled Ball and Race	487	489	489	
54 Bearing - Liberated by Hammering	507-8	508	508	
55 Photographs Made by Barish	525-6	532	532	1335
56 Photographs Made by Barish	525-6	532	532	1336
57 Photographs Made by Barish	525-6	532	532	1337
58 Pltf's Motion Picture	535	535	535	
59-A National Aircraft Std. NAS 36 Dec. 1942	540	541	541	1338
59-B National Aircraft Std. NAS 37 Dec. 1942	540	541	541	1339
59-C National Aircraft Std. NAS 38 Dec. 1942	540	541	541	1340

Description	Page References in Record			
	Identified	Offered	Received	Attached
60 Drawing Made by Colwell - "Chambers"	720	723	723	1341
61 Drawing Made by Colwell	758	758	758	1342
61-X Bearing From Visit to S.W. Prods. Plant	862	864		
61-Y Bearing From Visit to S.W. Prods. Plant	862	864		
62 Bearing From Visit to S.W. Prods. Plant	809	869	869	
63 Bearing From Visit to S.W. Prods. Plant	816	869	869	
64 Bearing From Visit to S.W. Prods. Plant	813	869	869	
65 Blueprint B-2400—S.W. Prod. Co.	866	869	869	1343
66 Bearing from Visit to S.W. Prods. Plant	828	869	869	
67 Bearing from Visit to S.W. Prods. Plant	829	869	869	
68 Photographs	936	936	936	
68 A-B- C-D Photographs	938	938	938	
69 Photographs	937	937	937	
70 Photographs	937	937	937	
71 Photographs	937	937	937	
72 Photographs	938	938	938	
73 Photographs	938	938	938	
74 Photographs	938	938	938	

DEFENDANT'S EXHIBITS

Def's Exh.	Description	Page References in Record			Vol. IV
		Identified	Offered	Received	
A	Cert. File History - Pat. '841	203	203	203	
B	Cert. File History - Pat. '172	203	203	203	
C	Cert. File History - Abandoned Appln. Ser. No. 767,496	204	204	204	
D	Book of Prior Art Patents	205	205	205	1344-1425
E1-E4	Drawings Attached to Potter's Deposition	(206- 207	(206- 207		1426-1429
F	Drawing - Halfco Bearing Race Blank Dated: 11/16/51 O.K. 9/4/52	208	208	209	1430
G	Blueprint - Def's Race Ring - Dated: 12/20/54	209	209	209	1431
H	Def's Rod End Bearing - H-10	209	209	209	
I	Two-Piece Bearing: HSPG-10S	209	209	210	
J-1	Section of a Ring - Before Press Forming	210	211		
J-2	Section of a Ring - After Press Forming	210	211		1432
K	Memo - Hackman 8/23/48	254	262	262	1435
L	Prof. Colwell's Report	587	648	648	1437-1450
L-1	Drawing - Kahr Process and Potter Process	690 691	691	691	1467
M-1	Pltf's Formed Bearing: BLR-3015	434	435	435	
M-2	Pltf's Formed Bearing: BLR-3015	434	435	435	
N-1	Rod End Bearing	461	463	463	
N-2	Rod End Bearing	461	463	463	
N-3	Ball and Shank	463	463	463	
N-4	Male Die Used For N-1 & N-2	470	470		
N-5	Male Die Used For N-1 & N-2	470	470		
O	Sketch by Tracey	461	461	461	1468
P	Copper Bar	595	690	690	
Q	Pages 81 & 82 - "Plastic Working in Presses"	597	690	690	1469-1470
R	Drawing by Prof. Colwell	628	690	690	
S	Drawing by Prof. Colwell - Diff in Coining & Bending	639	690	690	1471

Def's Exh.	Description	Page References in Record			
		Identified	Offered	Received	Vol. IV
	Drawing by Prof. Colwell - Spring Back	665	690	690	1472
J	Sawed-Off Bearing Specimen	758	1153	1153	
V-1	Ball and Shank - From Def's Plant	831	869	869	
V-2	Completed Press - Formed Rod End	831	869	869	
V	Formed Bearing - Def's Plant	836	870	870	
K-1	Tight Bearing - Def's Plant	839	870	870	
K-2	Rolled Bearing - Def's Plant	840	870	870	
V-1	Bearing - Four Punches	845	870	871	
V-2	Bearing - One Punch	845	870	871	
	Drawing Illustrating Straub's Testimony	944	944	944	1473
A	Military Specification	920	943	943	
A-1	Military Specification	923	943	943	
B	Drawing Used by Straub	943	949	949	1474
C-1	Chamber-Type Bearings	954	954	956	
C-2	Chamber-Type Bearings	954	954	956	
E-1	Blueprint - Lockheed Bearing Assy.	959	964	971	1475
D-1	Bearing, O&S Bearing & Mfg. Co.	959	961		
D-2	Catalog, O&S Bearing & Mfg. Co.	959	961		
E-2	Blueprint - Lockheed Bearing Assy.	971	972	973	1476
F	Blueprint - Boeing Bearing Rod End	974	974	974	1477
G	Spherical Self-Align. Bearing	977	994	995	1478
H	Blueprint - Def's Bearing Assy.	981	981	981	1479
I	Empty Race	993	993	993	
J	Bearing - KSSB-12-5 (Thin Walled)	1147	1147	1147	

